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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,094	08/22/2003	Yasuyuki Kawada	FUJI:270	9865

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EXAMINER	
RICKMAN, HOLLY C	
ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,094	KAWADA, YASUYUKI	
	Examiner	Art Unit	
	Holly Rickman	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-14 and 16-20* is/are pending in the application.

4a) Of the above claim(s) *14 and 16-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,4-13,20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 4-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 (and all claims depending therefrom) is rendered indefinite by the limitation "wherein the content of the oxide ranges from 1 to 15 at%." It is not clear how the content of a *molecule* such as silicon oxide can be measured in atomic percent. It appears that applicant intended to claim that the content of the "at least one element" is 1-15 at%. For purposes of examination, the examiner has interpreted the claim in this manner. It is noted that withdrawn claim 14 includes a similar limitation.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. The rejection of claims 1, 4-9 and 11-12 under 35 U.S.C. 102(e) as being anticipated by Litvinov et al. (US 6656613) is withdrawn in view of Applicant's amendments.

5. The rejection of claims 1-2, 4-9, and 11 under 35 U.S.C. 102(e) as being anticipated by Maesaka et al. (US 6596418) is withdrawn in view of Applicant's amendments.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 4-9, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litvinov et al. (US 6656613).

Litvinov et al. disclose a magnetic recording medium having a non-magnetic substrate, a Ta seedlayer, a soft magnetic NiFe layer (corresponding to backing layer set forth in claim 12), a second Ta layer and a FeAlN soft magnetic layer (corresponding to the second seed layer). The reference teaches forming a multilayered magnetic recording structure thereon having alternating layers of Pt or Pd and Co or Co alloys. The reference teaches adding a material such as Cr or SiO2 to the Pt/Pd and Co based layers (col. 4, lines 13-15 and 34-36; col. 6, lines 2-9).

Litvinov et al. teach all of the limitations of the claims except for the particular amount of Si ("said at least one element" which is present in the oxide molecule – that is, Litvinov meets

this limitation because it teaches the use of Si in the form of SiO2) and SiO2 contained within the Co and Pt/Pd layers and the use of a backlayer formed from CoZrNb or CoZrTa.

With respect to claim 6, it is noted that the reference teaches the first layer deposited on the substrate (or underlying layers) is a layer formed from Pt or Pd (see Figures 2 and 3 for example). Thus, it is the Examiner's contention that the first Pt or Pd layer corresponds to the Pt/Pd underlayer set forth in claim 6.

Litvinov et al. teach that the incorporation of SiO2 (thus, the incorporation of Si) in the magnetic recording structure exchange decouples the magnetic grains and also controls grain size (col. 2, lines 11-37). This is the same purpose Applicant discloses in paragraph 43 of the instant specification. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to determine the optimal amount of SiO2 to be introduced into each of the Co and Pt or Pd layers in order to achieve optimal grain size and exchange decoupling. Such an optimization would have been obvious since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). One of ordinary skill in the art would expect that such an optimization would necessarily result in the claimed ranges because applicant teaches that silica is added to the claimed Co and Pt/Pd layers for the purpose of grain isolation (grain decoupling) as well.

With respect to the limitation of claim 13, Litvinov et al. give an example wherein the backlayer is formed from NiFe but the reference teaches the equivalence of NiFe and CoZrNb (see col. 3, lines 29-32). Thus, it would have been obvious to one of ordinary skill in the art to substitute a CoZrNb layer for the NiFe layer taught by Litvinov et al. in column 6, lines 2-8 in view of the equivalence of the two materials.

8. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litvinov et al. (US 6656613) in view of Hanawa et al. (US 2002/0076579).

Litvinov et al. disclose a magnetic recording medium having a non-magnetic substrate, a Ta seedlayer, a soft magnetic NiFe layer (corresponding to backing layer set forth in claim 12), a second Ta layer and a FeAlN soft magnetic layer (corresponding to the second seed layer). The reference teaches forming a multilayered magnetic recording structure thereon having alternating layers of Pt or Pd and Co or Co alloys. The reference teaches adding a material such as Cr or SiO2 to the Pt/Pd and Co based layers (col. 4, lines 13-15 and 34-36; col. 6, lines 2-9). See paragraph 7, above, with respect to additional limitations of claim 10. With respect to claim 20, the limitation "the underlayer is composed of a ruthenium film" (emphasis added) has been interpreted to mean that the underlayer comprises a Ru film. Thus, the underlayer can include additional unrecited layers as well as unrecited elements in addition to Ru.

Litvinov et al. teach all of the limitations of the claims as detailed above, except for the use of a second seedlayer formed from NiFeCr, NiFeNbB, or NiFeSi (claim 10) or the use of a Ru underlayer (claim 20). The reference does teach the use of a NiFe layer underlying the magnetic superlattice structure and an FeAlN layer which corresponds to an "underlayer.".

Hanawa et al. teach the equivalence of NiFe, NiFeCr and NiFeSi for use as soft magnetic layers in magnetic recording media (See paragraph 37).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute NiFeCr or NiFeSi for the NiFe layer taught by Litvinov et al. in view of the functional equivalence of the materials as taught by Hanawa et al.

Hanawa et al. also teaches the equivalence of FeAl alloys such as FeAlSiTiRu. Thus, it would have been obvious to one of ordinary skill in the art to substitute a FeAlSiTiRu alloy for the FeAl based alloy disclosed by Litvinov in view of the art recognized functional equivalence of the materials. The examiner maintains that a "Ru film" as claimed reads of this particular Ru-containing alloy because the claim uses open language. Thus, it does not exclude the presence of unrecited elements.

Response to Arguments

9. Applicant's arguments filed 3/28/05 have been fully considered but they are not persuasive.

Applicant argues that the examiner has failed to make a prima facie case of obviousness with respect to Litvinov et al. Applicant maintains that the examiner has not provided any reasoning to support the position that optimizing the amount of SiO2 in the structure taught by Litvinov would result in the claimed ranges. As noted in the rejection above, Litvinov et al teach adding SiO2 to Co and Pt layers for the purpose of grain isolation/decoupling. Applicant also discloses that this is the purpose for adding SiO2 in the claimed invention. As such, one of ordinary skill in the art would expect that optimizing the amounts of SiO2 added to the Co and Pt layers taught by Litvinov would result in the claimed ranges.

Applicant also notes that the group of additive elements is narrowed. However, the examiner maintains that the claims still read on Litvinov because Si is one of the claimed additive elements. Thus, Litvinov's disclosure of SiO2 meets the limitations directed to an additive element Si and silicon oxide.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Holly Rickman
Primary Examiner
Art Unit 1773